

PROCEDURES FOR VASCULAR OCCLUSION

This application is a continuation of U.S. application Ser. No. 13/652,591, filed Oct. 16, 2012, now U.S. Pat. No. 9,095,460, issued on Aug 4, 2015, which is a continuation of U.S. application Ser. No. 12/751,997, filed Mar. 31, 2010, now issued as U.S. Pat. No. 8,409,269, which claims benefit under 35 U.S.C. §119(e) to U.S. Provisional Patent Application No. 61/288,525, filed Dec. 21, 2009, each of the above applications being expressly incorporated herein by reference in its entirety.

BACKGROUND

The present application generally relates to implantable devices for use within a patient's body and, more particularly, relates to methods for implanting occluding devices in a patient's body and monitoring an occlusion.

Lumens in the body can change in size, shape, and/or patency, and such changes can present complications or affect associated body functions. For example, the walls of the vasculature, particularly arterial walls, may develop pathological dilatation called an aneurysm. Aneurysms are observed as a ballooning-out of the wall of an artery. This is a result of the vessel wall being weakened by disease, injury or a congenital abnormality. Aneurysms have thin, weak walls and have a tendency to rupture and are often caused or made worse by high blood pressure. Aneurysms can be found in different parts of the body; the most common being abdominal aortic aneurysms (AAA) and the brain or cerebral aneurysms. The mere presence of an aneurysm is not always life-threatening, but they can have serious health consequences such as a stroke if one should rupture in the brain. Additionally, a ruptured aneurysm can also result in death.

SUMMARY

At least one aspect of the disclosure provides methods for implanting an occluding device or devices (e.g., stent or stents) in the body. The occluding device can easily conform to the shape of the tortuous vessels of the vasculature. The occluding device can direct the blood flow within a vessel away from an aneurysm. Additionally, such an occluding device can allow adequate blood flow to be provided to adjacent structures such that those structures, whether they are branch vessels or oxygen demanding tissues, are not deprived of the necessary blood flow.

In some embodiments, a method of reducing blood flow within an aneurysm can comprise injecting a contrast agent into a blood vessel comprising an aneurysm; deploying an occlusion device from a delivery system across the aneurysm; producing an image of the aneurysm including the contrast agent; and withdrawing the delivery device from the vessel after observing that the aneurysm has been obstructed by a desired amount.

In some embodiments, a method of reducing blood flow within an aneurysm can comprise injecting a contrast agent into a blood vessel comprising an aneurysm; deploying an occlusion device from a delivery device across the aneurysm; producing an image of the aneurysm including the contrast agent; observing a shape formed by the contrast agent after deploying the occlusion device; and withdrawing the delivery device from the vessel after observing the shape.

In some embodiments, a method of implanting a stent at an aneurysm can comprise: providing an elongate body comprising a proximal portion, a distal portion, and a lumen extending between the proximal portion and the distal por-

tion; advancing the elongate body into the patient until the distal portion is adjacent to the aneurysm; delivering a stent across the aneurysm from within the lumen at the distal portion of the elongate body, wherein delivering the stent comprises expanding the stent from a compressed configuration to an expanded configuration with a first location distal to the aneurysm and a second location proximal to the aneurysm; observing stagnation within the aneurysm caused by delivering the stent across the aneurysm; and withdrawing the elongate body from the patient with the expanded stent remaining across the aneurysm once the observed partial stagnation produces a persistent shape in the aneurysm.

In some embodiments, a method of reducing blood flow within an aneurysm can comprise: injecting a contrast agent into a blood vessel comprising an aneurysm, at least a portion of the contrast agent flowing into the aneurysm; deploying an occlusion device from a delivery device across the aneurysm; stagnating the portion of the contrast agent in the aneurysm; producing an image of the aneurysm including the portion of the contrast agent; observing a shape formed by the portion of the contrast agent in the aneurysm after deploying the occlusion device; and withdrawing the delivery device from the vessel after observing the shape.

In some embodiments, a method of implanting an occluding device can comprise implanting a stent at an aneurysm in a blood vessel by providing an elongate body comprising a proximal portion, a distal portion, and a lumen extending between the proximal portion and the distal portion; inserting the distal portion in a blood vessel comprising an aneurysm; advancing the distal portion within the blood vessel until the distal portion is at the aneurysm; advancing, relative to the elongate body and within the lumen of the elongate body, a stent in a compressed configuration; expanding the stent within the vessel, the expanded stent extending from a first location distal to the aneurysm to a second location proximal to the aneurysm; and following the expanding the stent and upon determining whether fluid flow in the aneurysm has stagnated by at least about 50% of an area or a volume of the aneurysm observed on an image, withdrawing the elongate body from the vessel.

In some embodiments, a method of at least partially obstructing an aneurysm can comprise advancing a delivery device within a blood vessel until a distal portion of the delivery device is adjacent the aneurysm; expanding a stent across the aneurysm; imaging the aneurysm; determining a degree of obstruction of the aneurysm after expanding the stent; and after determining that a body of the aneurysm has been obstructed at least about 50%, withdrawing the delivery device from the vessel.

In some embodiments, a method of treating an aneurysm can comprise advancing a delivery device within a blood vessel comprising an aneurysm until a distal portion of the device is adjacent the aneurysm; expanding a first stent within the vessel, the expanded first stent extending from a first side of the aneurysm to a second side of the aneurysm; and withdrawing the delivery device from the vessel upon determining that the aneurysm is between about 50% and about 100% occluded.

In some embodiments, a method of reducing blood flow within an aneurysm can comprise injecting a contrast agent into a blood vessel comprising an aneurysm; deploying an occlusion device from a delivery system across the aneurysm; producing an image of the aneurysm including the contrast agent; and withdrawing the delivery device from the vessel after observing that the aneurysm has been obstructed by a desired amount.